

# **JANOME DESKTOP ROBOT**

## **JR2000N Series**

# **Operation Manual**

## **Maintenance**

### **(For Maintenance Operation)**

Thank you for purchasing a Janome Robot.

- Read this manual thoroughly in order to ensure proper use of this robot. Be sure to read “For Your Safety” before you use the robot. The information will help you protect yourself and others from possible dangers during operation.
- After having read this manual, keep it in a handy place so that you or the operator can refer to it whenever necessary.

# **JANOME**

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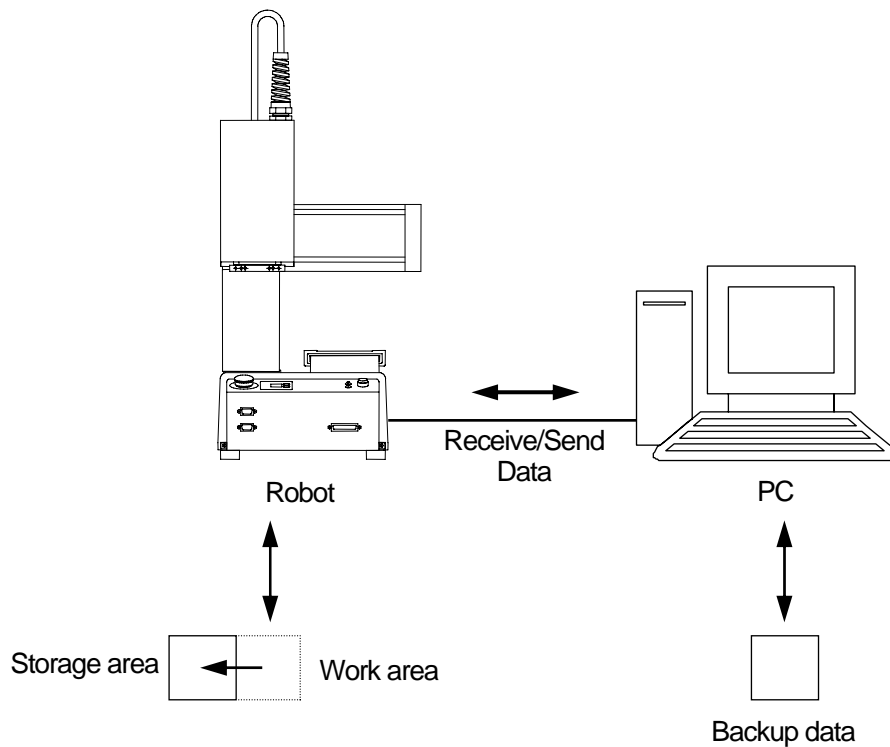
# HOW TO BACK UP THE C & T DATA

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Always remember to back up all data in case of accident.

To back up data, start the PC software JR C-Points Limited Edition included on the operation manual CD-ROM and retrieve data from the robot, then save the retrieved data in a file.

The data sent and received between the robot and the PC is the combination of teaching data and customizing data. The unit of data is called C & T data. Since the data is sent and received as a unit, you cannot send or receive any one specific program.



The robot has a data storage area and a work area. When you start the robot, the C & T data in the storage area will be copied to the work area. The copied data is used for running and teaching. The data in the work area will be deleted when the power to the robot is turned off.

When retrieving data from the robot, it will come from the work area. After sending data from the PC to the robot, the sent data will be saved in the storage area automatically via the work area.

- If you are using JR C-Points software (optional), it is also possible to back up the data by selecting [Receive C&T Data] from the [Robot] pull-down menu.

# TROUBLESHOOTING

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## Self-Diagnosis

When an error has occurred during operation or teaching, the error number and error message will be displayed on the teaching pendant LCD. If an error has occurred during operation, the robot will stop running. Fix the problem according to the error message.

If the teaching pendant is not connected, turn off the robot and then connect the teaching pendant to the robot. After turning it on again, an error message will be displayed on the teaching pendant LCD.

For details of errors and how to fix the problem, refer to the “ERROR MESSAGE” on Page 17 of this manual.

## Failure Diagnosis

If you are unsure if the robot is functioning properly, select [Diagnostic Mode] in the [Administration] menu.

The following menu items will be displayed on the teaching pendant LCD:

No.	Item	No.	Item
1	Key of Teaching Pendant	8	ZR Axis Motor
2	Teaching Pendant	9	Position of Sensor
3	Switch	10	External I/O
4	LED Buzzer	11	Emergency
5	State of Sensor	12	COM1 Communication
6	Z-Phase of Motor Driver	13	COM2 Communication
7	XY Axis Motor	14	COM3 Communication

Press the **MODE** key and select [Administration] from the Mode selection menu to start up the Administration Mode. Select [Diagnostic Mode] from the Administration Mode menu to enter the Diagnostic Mode. Select an item that you wish to check and check that it is functioning properly.



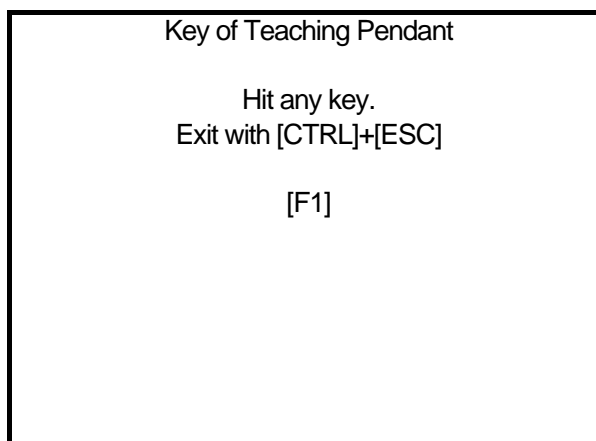
Be sure to turn off the robot after the diagnosis.

### Diagnosis for Teaching Pendant Keys

Press a key on the teaching pendant and check that the same key is displayed on the teaching pendant LCD.

Press the **CTRL** and **ESC** keys to return to the Diagnostic Mode menu..

Press the **SHIFT** and **ESC** keys to return to the Administration Mode menu.



### Teaching Pendant Diagnosis

Check the condition of the enable switch (optional), buzzer, LED, and LCD functions. Select an item that you wish to check. Press the **ESC** key to return to the Diagnostic Mode menu.

#### 1. Enable Switch (Optional)

When the enable switch is pressed, [ON] will be displayed. When it is released, [OFF] will be displayed.

#### 2. Buzzer

Press the **ENTR** key. The teaching pendant will display [ON] and the buzzer will beep. Press the **ENTR** key again. The teaching pendant will display [OFF] and the beeping will stop.

Teaching Pendant	
Enable Switch	OFF
<b>Buzzer</b>	<b>OFF</b>
LED1	ON
LED2	OFF
LED3	OFF
LED4	OFF
LED5	OFF
Back Light	ON
Screen	ON
Changing Display	
Contrast	Standard

**Teaching Pendant Diagnosis Screen**

#### 3. LED1 – LED5

Pressing the **ENTR** key toggles between [ON] and [OFF] and the corresponding LED 1 – 5 will be turned on and off.

- This is a test for the teaching pendant LED lighting. For example, the robot will not switch to the Teaching Mode if the LED [TEACH] is turned on in this diagnosis process.

#### 4. Back Light

Pressing the **ENTR** key toggles between [ON] and [OFF] and the backlight of the teaching pendant will be turned on and off.

## 5. Screen

Each time the **ENTR** key is pressed, the teaching pendant LCD will be turned on (menu items are displayed) and off (menu items disappear).

## 6. Changing Display

Each time the **ENTR** key is pressed, the teaching pendant LCD display will change in the following order:

Checkered pattern → highlighted checkered pattern → blank → white → teaching pendant diagnosis screen

## 7. Contrast

Each time the **ENTR** key is pressed, the teaching pendant LCD brightness and screen display will change in the following order:

Standard → High → Low → Standard

### Switch Diagnosis

Press or turn each switch and check that the switch status is displayed on the LCD properly.

Press the **ESC** key to return to the Diagnostic Mode menu.

Switch	
<b>Start Switch</b>	<b>OFF</b>
Emergency Switch	ON
Increment Number	OFF
Decrement Number	OFF
Special Mode Switch	OFF
Spare Switch	OFF

### 1. Enable Switch (Optional)

When the start switch is pressed, [ON] will be displayed.

### 2. Emergency Stop Switch

When the emergency stop switch is pressed, [ON] will be displayed.

### 3. Increment Number

When the program number increment switch is pressed, [ON] will be displayed.

### 4. Decrement Number

When the program number decrement switch is pressed, [ON] will be displayed.

### 5. Special Mode Switch

The current position of the special mode switch (ON or OFF) will be displayed.

### 6. Spare Switch

The current position of the special mode switch (ON or OFF) will be displayed.

- The current positions of the I/O-SYS internal/external power selector switch and the I/O-1 internal/external power selector switch will not be displayed.

### **LED Buzzer Diagnosis**

Select [Number Display]. The numbers will be displayed on the program number display in order of 00 → 11 → 22 → ... → 99 each time the **[ENTR]** key is pressed and the same number will be displayed on the teaching pendant LCD.

Select [Green LED] and [Red LED]. The red and green LEDs will switch ON and OFF each time the **[ENTR]** key is pressed and the ON/OFF indicator on the LCD will change accordingly.

Select [Buzzer]. Pressing the **[ENTR]** key will turn on the buzzer inside the robot and [ON] will be displayed on the LCD. If the **[ENTR]** key is pressed again, [OFF] will be displayed and the beeping will stop. Press the **[ESC]** key to return to the Diagnostic Mode menu.

LED Buzzer	
Number Display	33
Green LED	ON
Red LED	ON
Buzzer	OFF

### **State of Sensor Diagnosis**

Select [State of Sensor]. The screen shown to the right will appear.

The power to the motor will automatically go off when this screen appears. Move each Axis manually and check that the sensor status (ON or OFF) is properly displayed on the screen.

The indicator will be [ON] if the Axis goes further the initializing position in a negative direction.

Press the **[ESC]** key to return to the Diagnostic Mode menu.

State of Sensor	
X Axis Sensor	ON
Y Axis Sensor	ON
Z Axis Sensor	OFF
R Axis Sensor	ON

### **Z-Phase of Motor Driver Diagnosis**

Select [Z-Phase of Motor Driver]. The screen shown to the right will appear.

Press the **[F.4]** (INIT) key to start the mechanical initialization. The Z-Phases of the motors for all the Axes will be turned on after mechanical initialization.

Pressing any JOG key rotates each Axis motor by 1 Step (equal to a 1/10000 rotation of the motor).

A full 1 rotation of the motor will move the X- and Y-Axes about 50mm, the Z-Axis about 25mm,

Z-Phase of Motor Driver	
Z-Phase of X Motor	ON
Z-Phase of Y Motor	OFF
Z-Phase of Z Motor	ON
Z-Phase of R Motor	ON
INIT	

and the Y-Axis 90° (reference values).

Press the **[ESC]** key to return to the Diagnostic Mode menu.



## Caution

Always pay special attention to the robot's movement in the Diagnostic Mode.

### XY Axis Motor Diagnosis

Select [XY Axis Motor]. The screen shown to the right will appear.

Check the X-Axis motor drive and the Y-Axis motor drive on this screen.

You can set the output pulses, output pulse rate, Axis hold (excitation), and half power ON/OFF settings on this screen.

The [Number of Output Pulse] and [Rate of Output Pulse] settings are common to both the X- and Y-Axis motors. The default settings for [Number of Output Pulse] and [Rate of Output Pulse] are 10000 (equal to a full 1 rotation of the motor) and 1000.

Pressing any JOG key once rotates each Axis motor by the [Number of Output Pulse]. 10,000 output pulses will move the X- and Y-Axes about 50mm.

Press the **[F.4]** key to perform the mechanical initialization (to move all the X-, Y-, Z-, and R-Axes to their initial positions).

Press the **[ESC]** key to return to the Diagnostic Mode menu.

XY Axis Motor	
Number of Output Pulse	10000
Rate of Output Pulse	1000
X Axis Hold	ON
X Axis Half	OFF
Y Axis Hold	ON
Y Axis Half	OFF
INIT	



## Caution

Always pay special attention to the robot's movement in the Diagnostic Mode.



### ZR Axis Motor Diagnosis

Select [ZR Axis Motor]. The screen shown to the right will appear.

Check the Z-Axis motor drive and R-Axis motor drive on this screen.

You can set the output pulses, output pulse rate, Axis hold (excitation) and half power ON/OFF settings on this screen.

The [Number of Output Pulse] and [Rate of Output Pulse] settings are common to both the Z- and R-Axes motors. The default settings for [Number of Output Pulse] and [Rate of Output Pulse] are 10,000 (equal to a full 1 rotation of the motor) and 1,000.

Pressing any JOG key once rotates each Axis motor by the [Number of Output Pulse]. 10,000 output pulses will move the Z-Axis about 25mm and R-Axis about 90deg.

Press the **[F.4]** key to perform the mechanical initialization (to move all the X-, Y-, Z-, and R-Axes to its initial positions).

Press the **[ESC]** key to return to the Diagnostic Mode menu.

ZR Axis Motor	
Number of Output Pulse	10000
Rate of Output Pulse	1000
Z Axis Hold	ON
Z Axis Half	OFF
R Axis Hold	ON
R Axis Half	OFF
INIT	



### **Caution**

Always pay special attention to the robot's movement in the Diagnostic Mode.

### Position of Sensor Diagnosis

Press the **[F.4]** (INIT) key according to the instructions on the LCD. The mechanical initialization will start. After the mechanical initialization, the screen shown to the right will appear.

The phase error between the target stop position and the zero phase of each Axis motor will be displayed.

Check the phase error between the sensor position and the zero phase of the motor.

Position of Sensor	
X Axis Sensor	20%
Y Axis Sensor	30%
Z Axis Sensor	40%
R Axis Sensor	20%
CHANGE SENSOR	
INIT	

Press the **[F.0]** (CHANGE) key to change [%] indicator to [OK] or [Fault].

Press the **[F.1]** (SENSOR) key to change the screen display to the current sensor state display ([%] indicator will change to [ON] or [OFF]).

Press the **[F.4]** (INIT) key to perform the mechanical initialization again and refresh the display.



## Caution

Always pay special attention to the robot's movement in the Diagnostic Mode.

If the error is within a range of 25%, it is functioning properly.

If the error is not within a range of 25%, adjust the Axis sensor while referring to the service manual ("HOW TO ADJUST THE SENSOR") for your robot or contact the dealer from whom you purchased the robot.

To check the error again, press the **[F.4]** key and perform the mechanical initialization (move all the X-, Y-, Z-, and R-Axes to its initial positions).

Press the **[ESC]** key to return to the Diagnostic Mode menu.

### External I/O Diagnosis

Connect an external I/O test device (to check the input switch and output status) to the I/O-SYS and I/O-1 (optional) terminals and then select [External I/O].

The screen shown to the right will appear and the current I/O-SYS and I/O-1 statuses will be displayed. (ON: 1, OFF: \_)

The cursor is placed on the output status line. Shift the cursor using the **[CURSOR→]** and the **[CURSOR←]** keys. Pressing the **[ENTR]** key switches the output status ON or OFF.

Check that actual input/output statuses match the displayed statuses on the LCD and the test device.

If the I/O-1 (optional) has not been added on, the screen displays the I/O-SYS status only.

Press the **[ESC]** key to return to the Diagnostic Mode menu.

External I/O	
IO-SYS IN	6543210987654321 _____1_____
IO-1 IN	_____1_____
IO-SYS OUT	6543210987654321 _____1_____
IO-1 OUT	_____1__1_____

Changing Output with [ENTR] key

### Diagnosis for Emergency

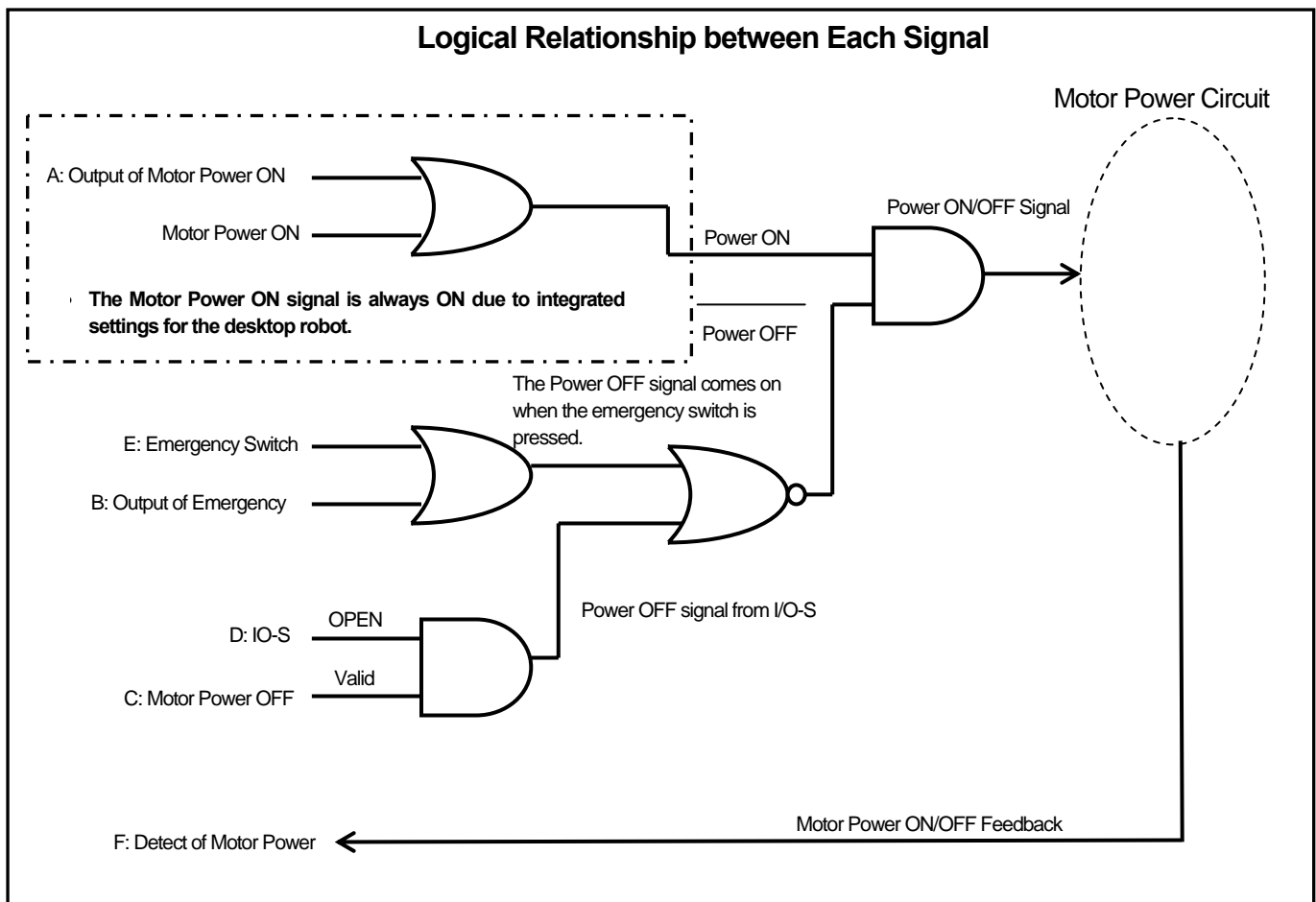
Check that the safety circuits such as the emergency stop and I/O-S are functioning properly.

There are six signals to be used and they are categorized into the three groups indicated below. (The items A – F are displayed on the screen.)

1. Motor Power ON Signal
  - A: Output of Motor Power ON
2. Motor Power OFF Signal
  - B: Output of Emergency
  - C: Motor Power OFF (Valid/Invalid)
  - D: IO-S (OPEN/CLOSE)
  - E: Emergency Switch
3. Motor Power Feedback Signal
  - F: Detect of Motor Power

Emergency	
Output of Motor Power ON	ON
Output of Emergency	OFF
Motor Power OFF	Invalid
IO-S	CLOSE
Emergency Switch	OFF
Detect of Motor Power	ON

The following diagram shows the logical relationship between each signal:



After diagnosis, be sure to check the following two results:

## 1. Input Signal

Check that the B: [Emergency Switch] and D: [IO-S] signals are input normally.

Emergency Switch		IO-S	
When the switch is pressed	ON	When the connector has short-circuited	CLOSE
When the switch is not pressed	OFF	When the connector has not short-circuited	OPEN

## 2. Emergency Stop Sequence

Check the F: [Detect of Motor Power] ON/OFF indicator when the A – E input signals come on while referring to the following chart indicating the logical relationship between the signals.

As shown in the diagram on the previous page, the Motor Power ON signal is always on regardless of whether A: [Output of Motor Power ON] is ON or OFF.

Accordingly, if the emergency stop sequence is functioning normally, F: the [Detect of Motor Power] ON/OFF indicator will not change if A: the [Output of Motor Power ON] ON/OFF indicator is changed.

A: Output of Motor Power ON	OFF	OFF	OFF	OFF	OFF
B: Output of Emergency	OFF	ON	OFF	OFF	OFF
C: Motor Power OFF	Valid	Valid	Valid	Valid	Invalid
D: IO-S	CLOSE	CLOSE	CLOSE	OPEN	OPEN
E: Emergency Switch	OFF	OFF	ON	OFF	OFF
F: Detect of Motor Power	ON	OFF	OFF	OFF	ON

## COM Communication (COM1 – COM3) Diagnosis

Set the baud rate and output character string on this screen and output the set character string from the COM1 port. Check that the output character string is displayed on the LCD properly.

Data received from COM1 is displayed in 1 byte HEX (left side) and ASCII (right side) characters on the bottom of the screen.

However, data sections 00H – 1FH and 7FH – FFH are displayed in HEX only. ASCII text will not be displayed (blank).

COM1 Communication	
<b>Baud Rate</b>	<b>9600</b>
Set Output String	
Execute Output String	
30 31 32 33 41 42 43 61 62 63 0123ABCabc	
64 0D d	

Set the baud rate as follows and check the output string results at each setting:

COM1	9600/19200/38400/57600/115200
COM2	9600/19200/38400/57600/115200
COM3	9600/19200

- The baud rate will be reset automatically to the settings in the [Administration Setting Mode] after the diagnosis.

# GREASE UP

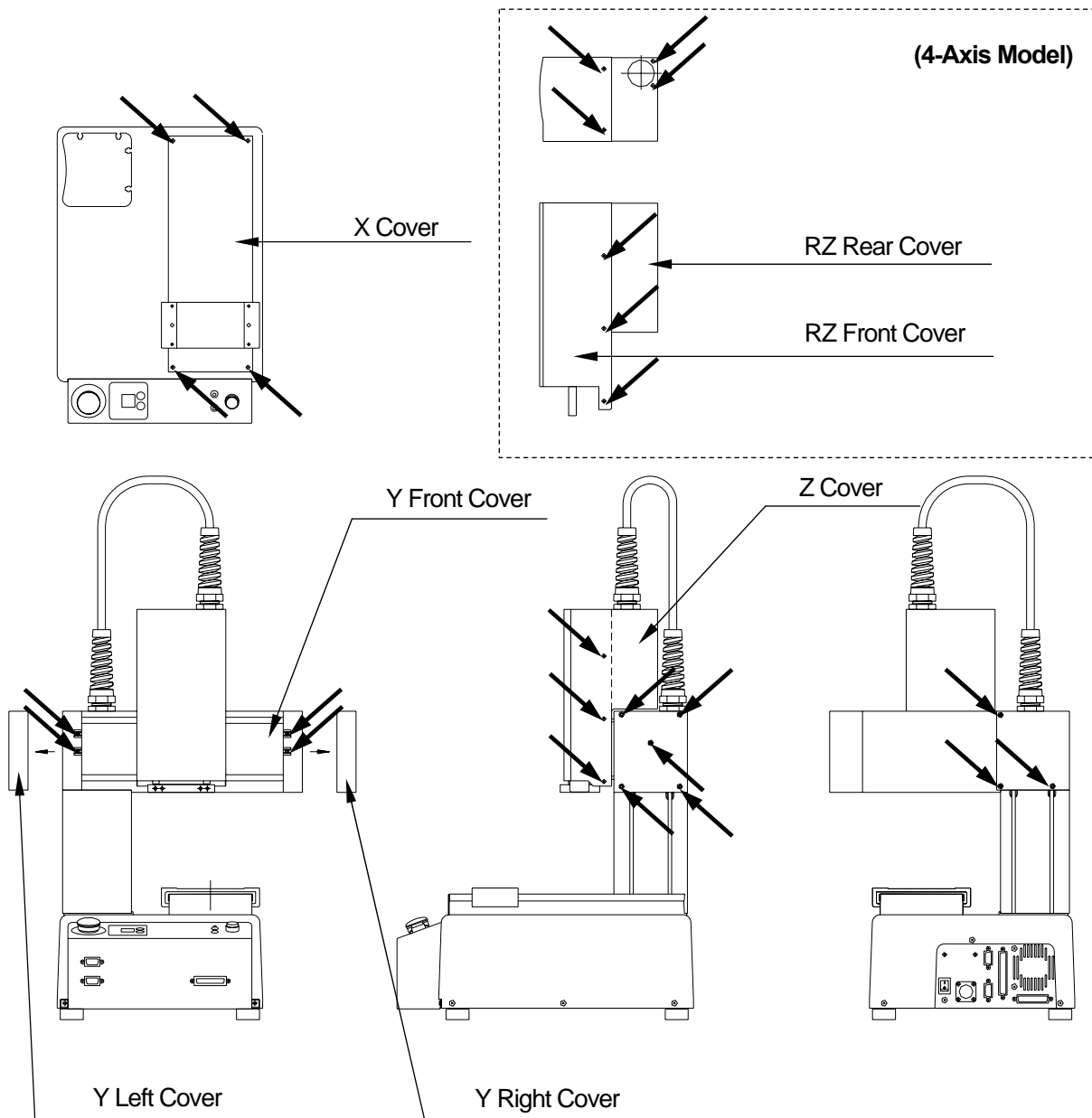
## Screws to be Removed for Greasing (indicated by black arrows)



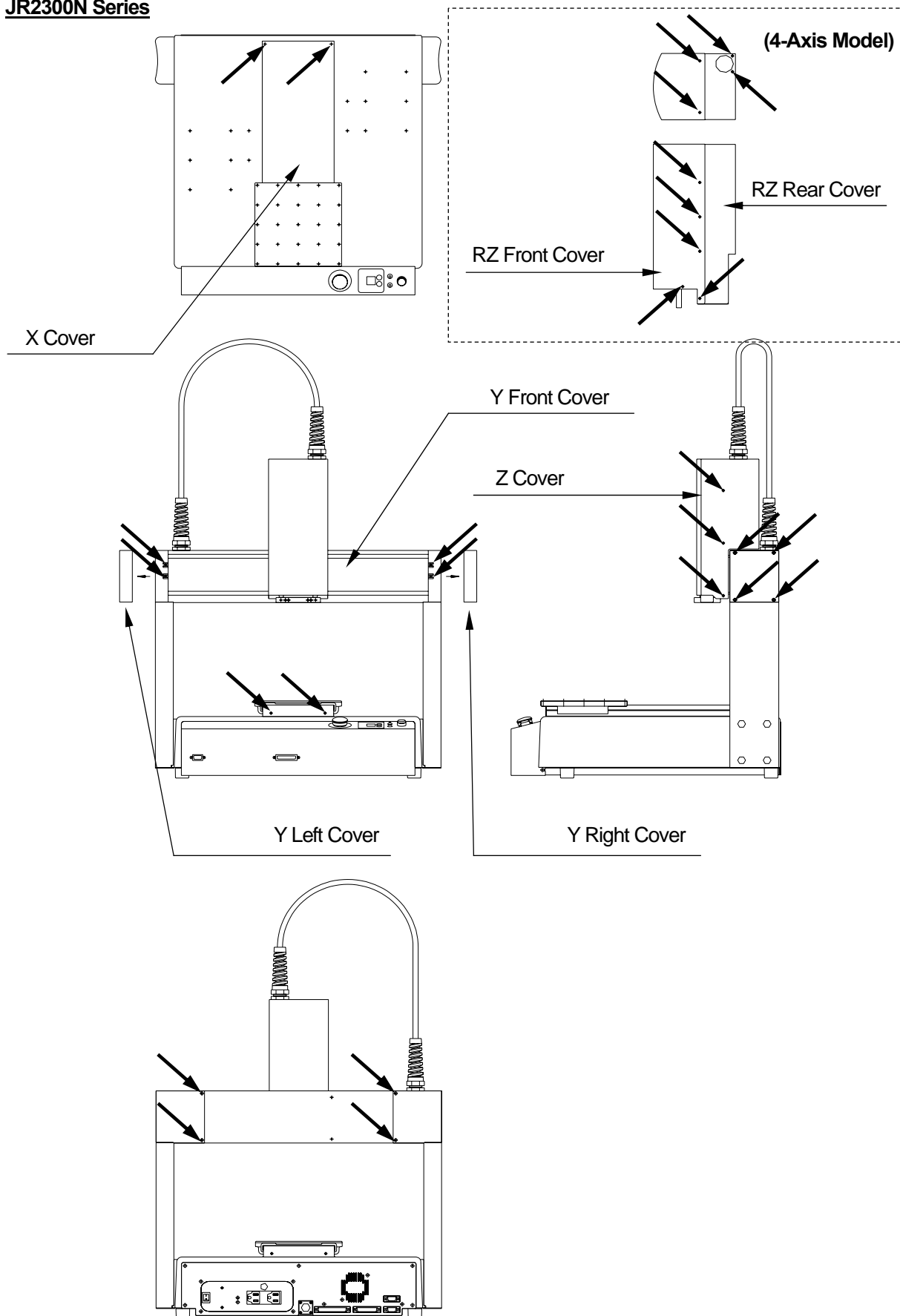
### Caution

Be sure to cut off the power supply to the robot before removing the screws or covers.

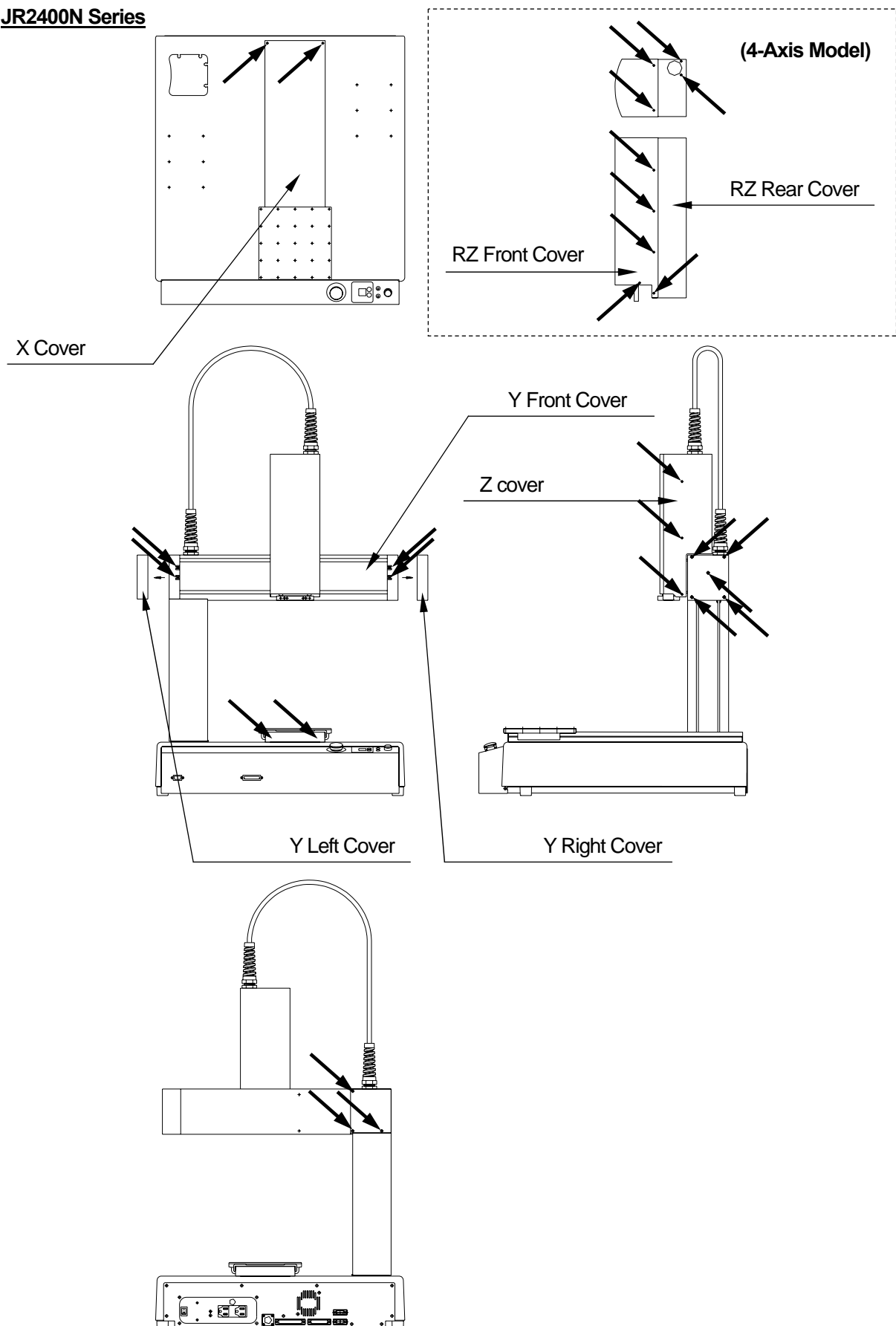
### JR2200N Series



## JR2300N Series



## JR2400N Series



## **Grease Up**



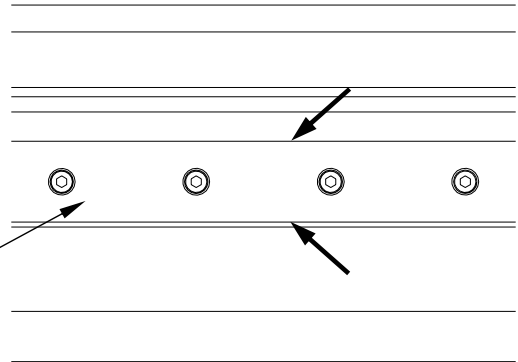
For smooth operation and long-term use of the robot, grease the robot regularly (approximately once every six months).

Grease the robot more frequently if running it long hours or repeating reciprocating movements.

### **LM Guide (X-Axis)**

1. Remove the four screws (indicated by black arrows in the “Screws to be Removed for Greasing” on Pages 11 – 13) fastening the X cover and remove the cover.
2. Wipe the grease on the both sides of the LM guide rail and grease the rail.

LM Guide (Rail)



### **LM Guide (Y-Axis)**

1. Remove the thirteen screws (indicated by black arrows in the “Screws to be Removed for Greasing” on Pages 11 – 13) fastening the Y left and right covers and remove the covers.
2. Remove the four screws (indicated by black arrows in the “Screws to be Removed for Greasing” on Pages 11 – 13) fastening the Y front cover and remove the cover.
3. Wipe the grease on both sides of the LM guide rail and grease the rail.

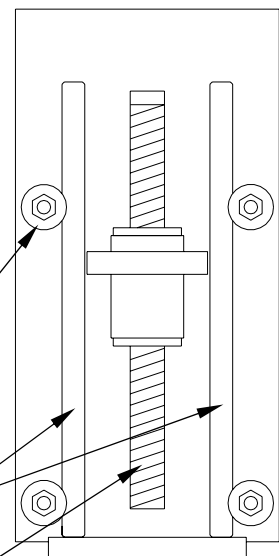
### **Z Mechanism (3-Axis Model)**

1. Remove the six screws (indicated by black arrows in the “Screws to be Removed for Greasing” on Pages 11 – 13) fastening the Z cover and remove the cover.
2. Wipe the grease on the parts touching the Z-Axis guide rollers and grease them.
3. Wipe the grease on the ball screw shaft and grease it.

Guide Roller

Z-Axis

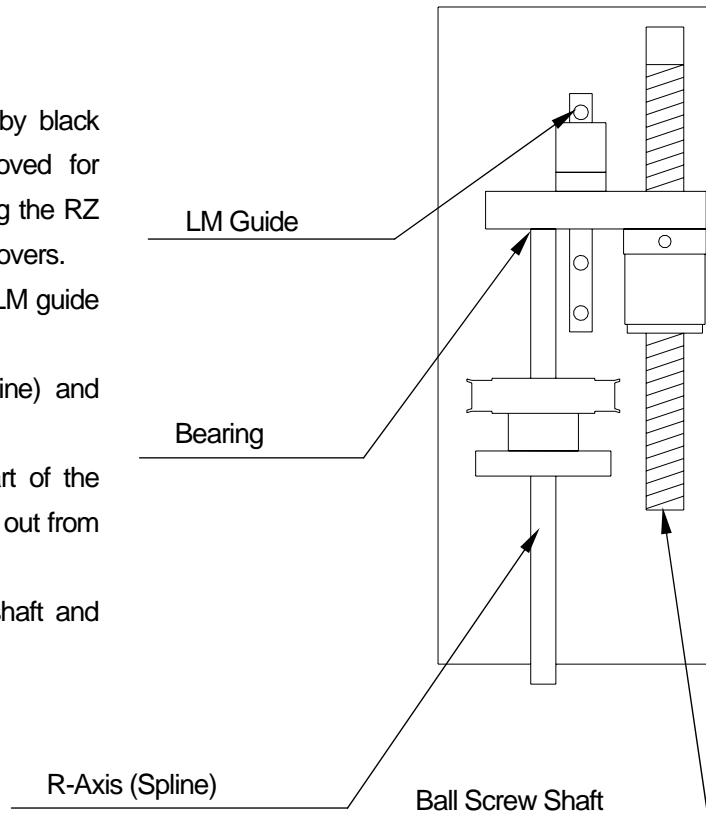
Ball Screw Shaft





### **RZ Mechanism (4-Axis Model)**

1. Remove the eight screws (indicated by black arrows in the “Screws to be Removed for Greasing” on Pages 11 – 13) fastening the RZ front and rear covers and remove the covers.
2. Wipe the grease on both sides of the LM guide rail and grease it.
3. Wipe the grease on the R-Axis (spline) and grease it.
4. Grease the bearing on the upper part of the R-Axis and wipe the grease that came out from the R-Axis.
5. Wipe the grease on the ball screw shaft and grease it.



Use recommended grease to prevent malfunction of the robot.

Recommended grease: Shell Alvania Grease S2 manufactured by Showa Shell Sekiyu K.K.

# HOW TO DOWNLOAD THE ROBOT SYSTEM SOFTWARE

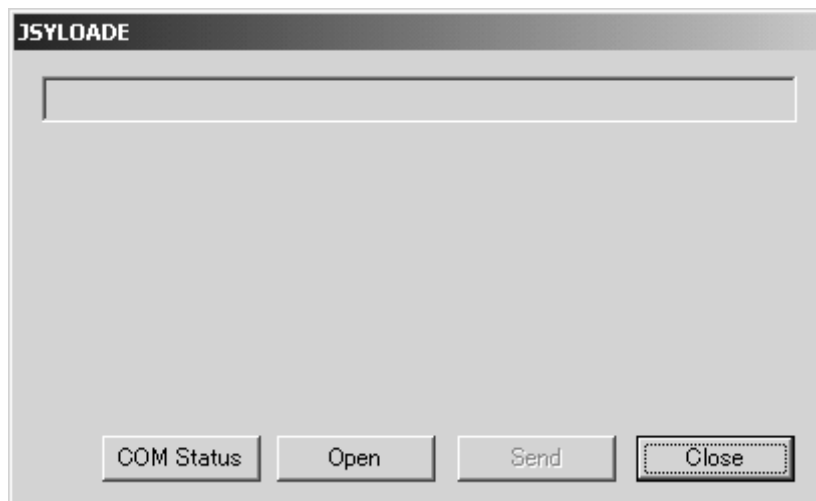
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This robot is controlled by built-in robot system software and a model configuration file. To upgrade the robot system software, follow the instructions below. (Be sure to connect the robot to the PC before starting this operation.)

The robot system software is included on the operation manual CD-ROM with the following file names:

**JRN\_xxx\_XXX.jsy** (“xxx” varies according to applications. “XXX” indicates the version number.)

1. Turn off the robot and remove the panel cover on the left side of the robot to **slide the special mode switch to ON**.
2. Turn on the robot again, copy the “JSYLOADE” software included on the operation manual CD-ROM to the local disk on the PC and start it.
3. Select the communication port of your PC connected to the robot and then click [OK].
4. Select [Open] on the dialog box and specify the robot system software to be downloaded. Then click [Send].



5. After the transmission, turn off the robot and **slide back the special mode switch to OFF**, then reattach the panel cover on the side of the robot.
- If you are using JR C-Points software (optional), the robot system software can also be upgraded by selecting [Send Robot System Software] from the [Robot] pull-down menu.

# ERROR MESSAGE

When an error occurs, the program number display on the front of the operation panel will alternately show the Er sign and the error number (excluding error numbers of 100 or larger).

## TP

If an error has occurred, the error number and error message will be displayed on the teaching pendant LCD. If the teaching pendant is not connected, turn the power off and connect the teaching pendant to the robot. After turning the power on again, the error number and error message will be displayed on the teaching pendant LCD.

## PC

If the robot is connected to a PC, select [System Error Information] or [Run Error Information] from the [Robot] pull-down menu in the JR C-Points software. All robot error information will be displayed. If the robot is not connected to a PC, turn the power to the robot off. (If the PC is on, turn it off.) Connect the PC to the robot, start up the PC and load the error information following the above procedures.

If the error cannot be fixed by the following countermeasures, contact the office listed on the back of this manual (Janome Sewing Machine Co., Ltd., Industrial Automation Systems Division) or the dealer from whom you purchased the robot.

Error No.	Message	Countermeasure
001	Program is Empty.	Enter the number of an existing program.
006	Point Type Error	For example, a CP passing point following a PTP point will return a point type error. Make sure that the point type entered is correct.
007	Position is out of range	In this case, "out of range" means that the position of the tool tip is outside the designated move area limit. This error occurs when either a point position or an intermediate path (as in a CP arc movement) falls out of the range. Check the teaching position coordinates and reenter it. Also check the move area limit and TCP (tool center point) settings in the tool data, and then reenter it.
008	Error on Point Job	Point job errors which are not classified as one of Errors 009 – 013, 016, and 042 – 053 fall into this category. <ul style="list-style-type: none"><li>● An <i>ld</i> or <i>ldi</i> corresponding to an <i>anb</i> or <i>orb</i> does not exist in the condition commands.</li><li>● There are more than 30 <i>then</i>, <i>else</i> or <i>timeUp</i> nests in a single point job routine.</li><li>● A <i>then</i>, <i>else</i> or <i>endlf</i> command does not have a corresponding <i>if</i> command.</li><li>● A <i>timeUp</i> or <i>endWait</i> command does not have a corresponding <i>waitCondTime</i> or <i>waitCond</i> command.</li></ul> Check the point job command and reenter it.

Error No.	Message	Countermeasure
009	then/else for if doesn't exist	This error includes the following cases: <ul style="list-style-type: none"> <li>● When a <i>then</i> or <i>else</i> corresponding to an <i>if</i> is missing.</li> <li>● When non-condition commands are entered between an <i>if</i> and a <i>then</i> or <i>else</i>.</li> </ul> Check the point job command and reenter it.
010	endlf for if doesn't exist	Check the point job command and reenter it.
011	endWait for waitCond doesn't exist	Check the point job command and reenter it.
012	Label for jump doesn't exist	Check the point job command and reenter it.
013	Point for goPoint doesn't exist	This error occurs when the jump point number of the point job command, <i>goPoint</i> , <i>goRPoint</i> , or <i>palletLoop</i> is larger than the largest point number in a program or when it will be a negative number. Check the point job command and reenter it.
016	Error on Pallet Routine Data	This error occurs when the pallet number designated by a point job command does not exist. Check the point job command or the designated pallet routine in the additional function and reenter it.
022	CP Speed Over	Reduce the CP (line) speed.
030	FLROM Erase Error	All C & T data from FLROM should be automatically deleted before saving. If this doesn't occur, it is probably due to a hardware error.
031	FLROM Write Error	A write error can occur when saving C & T data. This could be a hardware error.
035	Teaching Data SUM Error	When the power to the robot is turned on, the C & T data in the storage area will be copied to the work area. If these two data sets are not identical, this error will occur. Delete the C & T data. This error will also occur if the power to the robot is turned off while saving C & T data.
037	Motor Power Supply Error	This message will appear when the motor power is not supplied. Check the motor power supply. <ul style="list-style-type: none"> <li>● If the power supply connector or one of the thermal protectors is defective, check the connection for the parts.</li> <li>● If the power source is defective, replace the power source unit.</li> </ul>
042	Job for callJob doesn't exist	Check the point job command and reenter it.
043	callJob Nesting Error	This error occurs when there are more than 30 <i>callJob</i> or <i>callBase</i> nests in a single point job routine. Check the point job command and reenter it.
044	Program for callProg doesn't exist	Check the point job command and reenter it.

Error No.	Message	Countermeasure
045	callProg Nesting Error	This error occurs when there are more than 30 <i>callProg</i> or <i>callPoints</i> nests in a single point job routine. Check the point job command and reenter it.
046	for, do Nesting Error	This error occurs when there are more than 30 <i>for</i> or <i>do</i> nests in a single point job routine. Check the point job command and reenter it.
047	Points for callPoints doesn't exist	Check the point job command and reenter it.
048	for-next, do-loop Error	This error occurs when a <i>next</i> corresponding to a <i>for</i> or a <i>loop</i> corresponding to a <i>do</i> does not exist. It also occurs when a <i>next</i> or a <i>loop</i> appears even though a <i>for</i> or a <i>do</i> does not exist. Check the point job command and reenter it.
049	Creating Local Variable Error	This error occurs if identifiers are overlapped using a <i>declare</i> command or if the variable range is impossible when generating a local variable. Check the point job command and reenter it.
050	Evaluate Expression Error	This error occurs if the following errors are detected during expression evaluation. <ul style="list-style-type: none"> <li>● No variable or function is included in expression It is probable that the variable identifier or function identifier is wrong and the variable or the function may not have been defined.</li> <li>● Wrong brackets</li> <li>● Wrong operators (e.g. +, -, *, /)</li> <li>● Wrong argument counts or types (including the numbers of array element successor functions) during a function call operation.</li> </ul> Check the point job command and reenter it.
051	IO Alias Error	This error occurs if there is no IO alias specified. It is probable that the identifier is wrong or there is no definition. Check the point job command and reenter it.
052	COM Alias Error	This error occurs if there is no COM alias specified. It is probable that the identifier is wrong or there is no definition. Check the point job command and reenter it.
053	Parameter value is out of range	This error occurs if the expression evaluation value exceeds the range. Check the point job command and reenter it.

Error No.	Message	Countermeasure
082	Emergency Stop	<p>This error occurs when the emergency stop button on the teaching pendant or operation box has been pressed or the I/O-S emergency stop function (CE model only) has been activated.</p> <p>Release the emergency stop then send the start signal to perform the mechanical initialization.</p>
085	Incorrect Use	<p>This error occurs if the system program applications and those of C &amp; T data are different. For example, if you register dispensing programs in the robot's RAM and then transfer the standard application system programs to the robot, it will return an error when the power is turned on.</p> <p>Delete all C&amp;T data or change the system program.</p> <p>If the teaching pendant is connected, the message [All Teaching Data Delete OK?] will be displayed on the LCD.</p> <p>Select [YES] to delete the C &amp; T data.</p>
086	Incorrect Data Version	<p>This error occurs if the data version number of the system program is lower than that of the teaching data. In other words, the system program version does not match the teaching data version registered in the robot.</p> <p>Delete all teaching data or update the system program.</p> <p>If the teaching pendant is connected, the message [All Teaching Data Delete OK?] will be displayed on the LCD.</p> <p>Select [YES] to delete the C &amp; T data.</p>
087	Incorrect Data Sub Version	<p>This error occurs if the data sub version number of the system program is lower than that of the teaching data. In other words, the system program version does not match the teaching data version registered in the robot.</p> <p>Delete all teaching data or update the system program.</p> <p>If the teaching pendant is connected, the message [All Teaching Data Delete OK?] will be displayed on the LCD.</p> <p>Select [YES] to delete the C &amp; T data.</p>
089	Z Sensor/Motor Error	<p>This error occurs if the Z sensor does not open or close after rotating the Z motor according to the preset pulse output during mechanical initialization.</p> <p>If the Z motor is rotating, the error has been caused by a sensor malfunction.</p> <p>If the Z motor is not rotating, it has been caused by a motor malfunction. (Mechanical initialization error)</p>

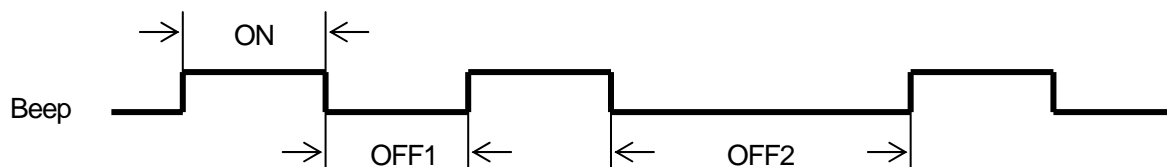
Error No.	Message	Countermeasure
090	Z Driver 0-Phase Error	This error occurs when the driver Z-Phase signal is not output at all or if it continues to be output after rotating the Z motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
092	X Sensor/Motor Error	This error occurs if the X sensor does not open or close after rotating the X motor according to the preset pulse output during mechanical initialization. If the X motor is rotating, the error has been caused by a sensor malfunction. If the X motor is not rotating, it has been caused by a motor malfunction. (Mechanical initialization error)
093	X Driver 0-Phase Error	This error occurs when the driver X-Phase signal is not output or if it continues to be output after rotating the X motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
095	Y Sensor/Motor Error	This error occurs if the Y sensor does not open or close after rotating the Y motor according to the preset pulse output during mechanical initialization. If the Y motor is rotating, the error has been caused by a sensor malfunction. If the Y motor is not rotating, it has been caused by a motor malfunction. (Mechanical initialization error)
096	Y Driver 0-Phase Error	This error occurs when the driver Y-Phase signal is not output or if it continues to be output after rotating the Y motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
098	R Sensor/Motor Error	This error occurs if the R sensor does not open or close after rotating the R motor according to the preset pulse output during mechanical initialization. If the R motor is rotating, the error has been caused by a sensor malfunction. If the R motor is not rotating, it has been caused by a motor malfunction. (Mechanical initialization error)
099	R Driver 0-Phase Error	This error occurs when the driver R-Phase signal is not output or if it continues to be output after rotating the R motor according to the preset pulse output during mechanical initialization. (Mechanical initialization error)
100	Logical Error XXXXXX	This error number will not be displayed on the program number display, but will be on the teaching pendant LCD or PC. Turn the power off briefly and then turn it on again. If the error occurs repeatedly, contact the office listed on the back of this manual or the dealer from whom you purchased the robot and describe the error message (XXXXXX).
101	Trap Error	A beep will briefly sound twice when this error has occurred. Turn the power off briefly and then turn it on again. The error message and number will be displayed on the teaching pendant LCD. It is necessary to replace printed circuit board A (unit). Contact the office listed on the back of this manual or the dealer from whom you purchased the robot.

## Power-On Error

No error number or message will be displayed on the LCD for the errors indicated below. Identify the error type by the following sounds:

Buzzer	Description
One long beep	Special mode program error This error occurs if the special mode program does not exist or has been damaged (judged by the SUM check command) when turning the power ON in the special mode. It is necessary to replace printed circuit board A (unit). Contact the dealer from whom you purchased the robot.
Two long beeps	System program error This error occurs if the system program does not exist or has been damaged (judged by the SUM check command). It may be possible to fix the problem by switching to the special mode and reinstalling the system program. Contact the dealer from whom you purchased the robot.
Two short beeps	Trap error It is necessary to replace printed circuit board A (unit). Contact the dealer from whom you purchased the robot.
One two-second beep	Flash ROM write error It is necessary to replace printed circuit board A (unit). Contact the dealer from whom you purchased the robot.

The beeps sound repeatedly at 1.2-second (OFF2) intervals. The long and short tones are distinguished by the duration of the beeps to help you identify the error types.



	ON	OFF1	OFF2
Long beep	0.6 [sec]	0.6 [sec]	1.2 [sec]
Short beep	0.2 [sec]	0.2 [sec]	1.2 [sec]

### e.g. 1: Three Short Beeps

ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	ON	. . . . .
0.2	0.2	0.2	0.2	0.2	1.2	0.2	0.2	0.2	0.2	1.2	0.2	[sec]

### e.g. 2: One Long Beep

ON	OFF	ON	OFF	ON	OFF	. . . . .
0.6	1.2	0.6	1.2	0.6	1.2	[sec]



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